Future of Energy Codes: Stretch Codes The Massachusetts Experience

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Purpose of Discussion

How Stretch Codes Can Help With Market Transformation

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Plan

- Discussion will focus on stretch codes
- What are stretch energy codes?
- Massachusetts example

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Stretch Code Discussion

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What Are Stretch Energy Codes

- Stretch Energy Code
  - Code that results in more energy efficient buildings on average than the locally enforced energy code.
  - The locally enforced code can be the national model codes (either the International Energy Conservation Code or ASHRAE 90.1) or state codes that differ from the national model such as in California, Oregon or Washington.

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Why Pursue Stretch Codes

- Desire by communities achieve more energy efficiency
- State incentives
- Provide guidance for future energy codes
- Opportunity to train the building and development community in advanced building practices

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What Makes an Effective Stretch Code

- Must generate more energy savings than locally enforced code (on average)
- Stretch Code must be “buildable”
- Stretch Code must be enforceable
- Designed to become the regular code in subsequent code adoption cycles
- Can design training and enforcement protocols for it

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Stretch Code Positives

- Help building professionals learn new tools and techniques that achieve greater energy efficiency.
- Shows that energy efficient construction can be done.
- Provides incentive to constantly update energy efficiency programs for new construction.
- Guide the way to Net-Zero Energy Buildings

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When/How

- State law can allow local jurisdictions to adopt reach code (often under restrictive conditions)

- If state law prohibits local jurisdictions from adopting code other than state code ("min-max provision"):
  - Incorporate Stretch Code as "Informative Appendix"
    - Tie to energy efficiency programs
    - Tie to public building construction policies
    - Provide guidance to building community

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Green Rating Systems are Not the same Thing

- Green Building Rating Systems such as LEED or the National Association of Home Builders National Green Building Standard are **not** appropriate as stretch codes

- Energy Codes (including stretch codes) set the floor on energy efficient design and construction (worst home that legally can be built)

- Rating systems raise ceiling on green (including energy efficient) design and construction

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State Process to Net Zero

- Efficiency programs institutionalizes best practices
- State incorporates program requirements as stretch code
- State adopts stretch code as statewide code
- Lather, Rinse Repeat
- Final Stop… Net Zero

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Setting the Stage

- State must adopt appropriate policies/programs
  - Allow local option codes
  - Provide incentives to local jurisdictions
  - Do not disincentivize efficiency programs
  - Provide support if possible
    - Specialized/Additional training

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Massachusetts Stretch Code

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Background on MA Stretch Code

- State Legislation “Green Communities Act” provided incentives to adopt energy efficient codes; GCA also allowed local jurisdictions to adopt their own codes.
- Developed in response to call from towns and cities for a stretch code
- Board of Building Regulations and Standards designed training for both the regular state code and the stretch code.

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Concerns

- Opponents worried about multiplicity of codes within state
- Large number of possible examples and no clear guidance on what to choose
- What would guarantee energy savings.

Solution

- One alternative code for residential and commercial buildings; respectively
  - Energy Star for residential
  - Based on Core Performance Guide for commercial

Allows for use of methods that are related to energy efficiency programs; proven to save energy and can be actually built cost effectively.

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Utility Support of Stretch Code

- National Grid very important in effort.
- Provided information on energy savings and cost effectiveness.
- Proved viability of code.
- MA needed to ensure that Nat Grid was not harmed by stretch code.

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Residential- Energy Star

- HERS Rating of 65 or 70 (Depending on Size of Home)
- Roughly 15% to 20% more energy efficient than 2009 IECC.
- Such a home would include:
  - Significantly lower air infiltration
  - Significantly tighter ducts
  - Mechanical ventilation system.
  - Use of high efficiency water heaters such as instantaneous tankless units
  - High Efficiency Heating and Cooling Equipment

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Commercial- CPG

- Commercial stretch code prescriptive path is based on New Buildings Institute Core Performance Guide (CPG) and follows IECC formatting and section numbers.

- Used CPG because building community had experience with it. Used in new construction energy efficiency program.

- Compliance achieved by demonstrating 20% less energy usage than ASHRAE 90.1 – 2007, either by prescriptive or performance approach.

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Areas of Improvement

Prescriptive Requirements That Go Beyond the ASHRAE 90.1-2007

- More stringent opaque envelope
- More stringent window efficiency
- More stringent fenestration air tightness
- More detailed commissioning requirements

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New Items Not Found in 90.1-2007

- *Design Intent* (Not in 120.AA but important component of stretch codes)
- Addition of air barrier
- HVAC Trade-Off
- Adds possibility of using renewable energy
- Additional Lighting Controls

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2012 IECC

- Chapter 5 of the 2012 IECC Based on Massachusetts Stretch Code

- Many requirements in Energy Star Homes (such as mechanical ventilation) incorporated into Chapter 4 of 2012 IECC.

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Keys to Successful Stretch Code Adoption and Implementation

- Need appropriate policies
- Use existing programs as guides
- Limit options
- Design with eye on making stretch the model
- Utility involvement crucial

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Which Leads to Our Next Presenter

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